

Pre-calculus		
<b>Standard 1: Students will acquire number sense and perform operations with real and complex numbers.</b>		
<b>Objective 1: Compute fluently and make reasonable estimates.</b> a. Add, subtract, multiply, and find the absolute value using complex numbers. b. Add, subtract and perform <b>scalar multiplication on vectors</b> using a variety of techniques with or without the use of technology.	<b>Objective 2: Represent complex numbers and vectors in a variety of ways.</b> a. Represent vectors graphically and symbolically. b. Represent <b>complex numbers</b> in <b>rectangular</b> and <b>polar</b> form and convert between rectangular and polar form.	<b>Objective 3: Identify relationships among complex numbers and vectors and operations involving these items.</b> a. Analyze properties of vectors and their effects on vector operations. b. Analyze properties of complex numbers and their effects on operations in rectangular and polar form. c. Develop and use the <b>limit</b> definition of e.
<b>Standard 2: Students will represent and analyze mathematical situations and properties using patterns, relations, functions, and algebraic symbols.</b>		
<b>Objective 1: Use patterns, relations, and functions to represent mathematical situations.</b> a. Identify the <b>domain</b> , <b>range</b> , and other attributes of <b>families of functions</b> and their inverses, i.e., <b>exponential</b> , <b>polynomial</b> , <b>rational</b> , <b>logarithmic</b> , <b>piece-wise</b> , and <b>trigonometric</b> . b. Simplify expressions or solve equations using a variety of approaches and techniques, e.g., polynomial long division, Rational Root Theorem, logarithms, and partial fractions. c. Write functions and relations in <b>parametric form</b> . d. Identify <b>vector-valued functions</b> using a variety of approaches, e.g., algebraically or graphically. e. Identify and generate <b>arithmetic</b> and <b>geometric sequences</b> and <b>series recursively</b> and <b>explicitly</b> using correct notation. f. Identify a <b>geometric series</b> as <b>convergent</b> or <b>divergent</b> . g. Raise a binomial to a power using the <b>Binomial Theorem</b> .	<b>Objective 2: Evaluate, solve, and analyze mathematical situations using algebraic properties and symbols.</b> a. Solve equations and inequalities involving exponential, logarithmic, power, polynomial, rational, and trigonometric functions, including real-world situations. b. Compare logarithmic and exponential functions. c. <b>Combine and compose</b> functions using algebraic methods or by using technology when appropriate. d. Identify the domain and range of a function resulting from the combination or composition of functions. e. Solve systems of linear equations involving three or more variables using a variety of methods. f. Solve systems of <b>non-linear</b> equations and inequalities. g. Find the x- and y-intercepts, zeros (roots), <b>maxima</b> , and <b>minima</b> of functions. h. Approximate <b>instantaneous rates</b> of change and find <b>average rates of change</b> using graphical and numerical data. i. Determine <b>intervals</b> over which a function is increasing or decreasing.	<b>Objective 3: Represent quantitative relationships using mathematical models and symbols.</b> a. Represent quantitative, real-world situations using exponential, logarithmic, power, polynomial, rational, and trigonometric functions, vector and parametric equations, and sequences and series. b. Identify and analyze graphical features of functions such as <b>asymptotes</b> , <b>holes</b> , <b>local</b> , <b>global</b> , and <b>end behavior</b> . c. Recognize symmetric properties of <b>even</b> and <b>odd functions</b> . d. Relate the graphical representation of <b>discontinuities</b> and <b>end-behavior</b> to the concept of limit. e. Identify the effects of changing the <b>parameters</b> in <b>transformations</b> of functions. f. Identify a family or families of functions that model real-world relationships.
<b>Standard 3: Students will solve problems using spatial and logical reasoning, applications of geometric principles, and modeling.</b>		
<b>Objective 1: Analyze characteristics and properties of two- and three-dimensional shapes and develop mathematical arguments about geometric relationships.</b> a. Determine and analyze the characteristics of graphs and the related equations of conic sections. b. Analyze problems and solutions involving vectors using algebraic and graphical techniques.	<b>Objective 2: Specify locations and describe spatial relationships using coordinate geometry.</b> a. Perform <b>transformations</b> on exponential, power, polynomial, rational, logarithmic, and trigonometric functions. b. Draw or sketch polar equations using technology and other techniques.	

<b>Standard 4: Students will understand and apply measurement tools, formulas, and techniques.</b>		
<b>Objective 1: Understand measurable attributes of objects and the units, systems, and processes of measurement.</b> a. Select appropriate units and scales for situations involving measurement. b. Recognize the changes in magnitude with various measurement scales, e.g., Richter, pH, decibel.		
<b>Standard 5: Students will draw conclusions using concepts of probability after collecting, organizing, and analyzing a data set.</b>		
<b>Objective 1: Formulate and answer questions by collecting, organizing, and analyzing data.</b> a. Find <b>regression equation</b> for <b>bivariate</b> data including power, exponential, logarithmic, polynomial, and <b>sinusoidal</b> curves using technology. b. <b>Interpolate</b> and <b>extrapolate</b> from data using regression equations. c. Identify how sample statistics reflect population parameters.	<b>Objective 2: Apply basic concepts of probability.</b> a. Find <b>sample spaces</b> and <b>probability distributions</b> in simple cases. b. Differentiate between <b>independent</b> and <b>dependent events</b> and calculate the probability of each. c. Calculate the <b>conditional probability</b> of an event. d. Calculate the probability of a <b>compound event</b> . e. Calculate and interpret the <b>expected value (weighted average)</b> of random variables in simple cases.	